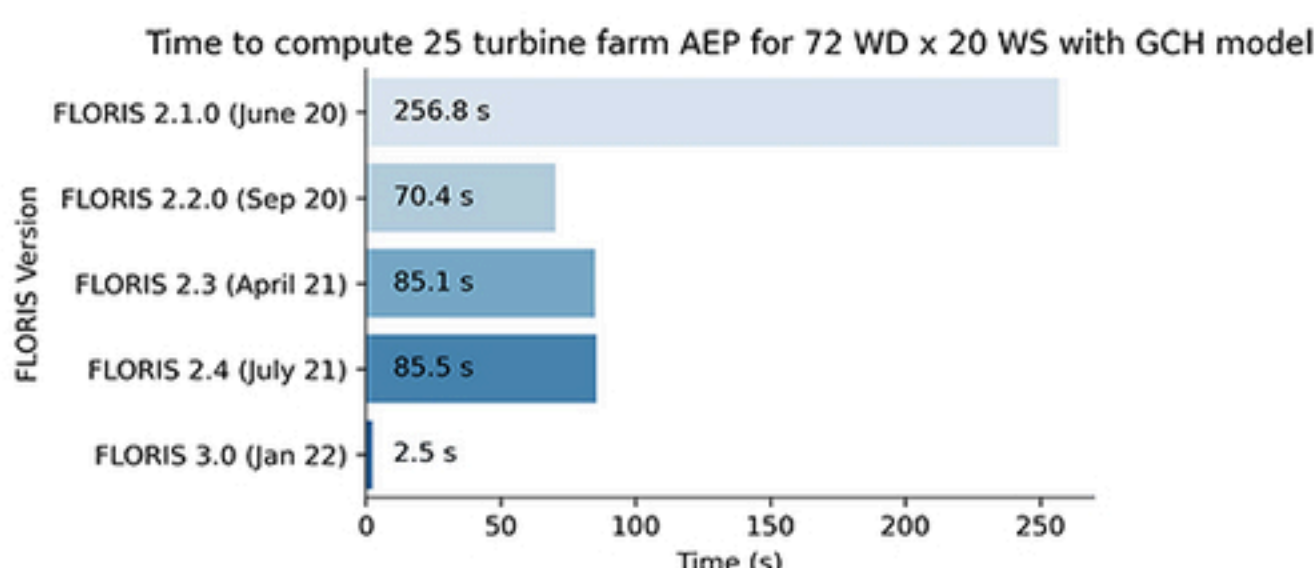


Wednesday, January 19, 2022

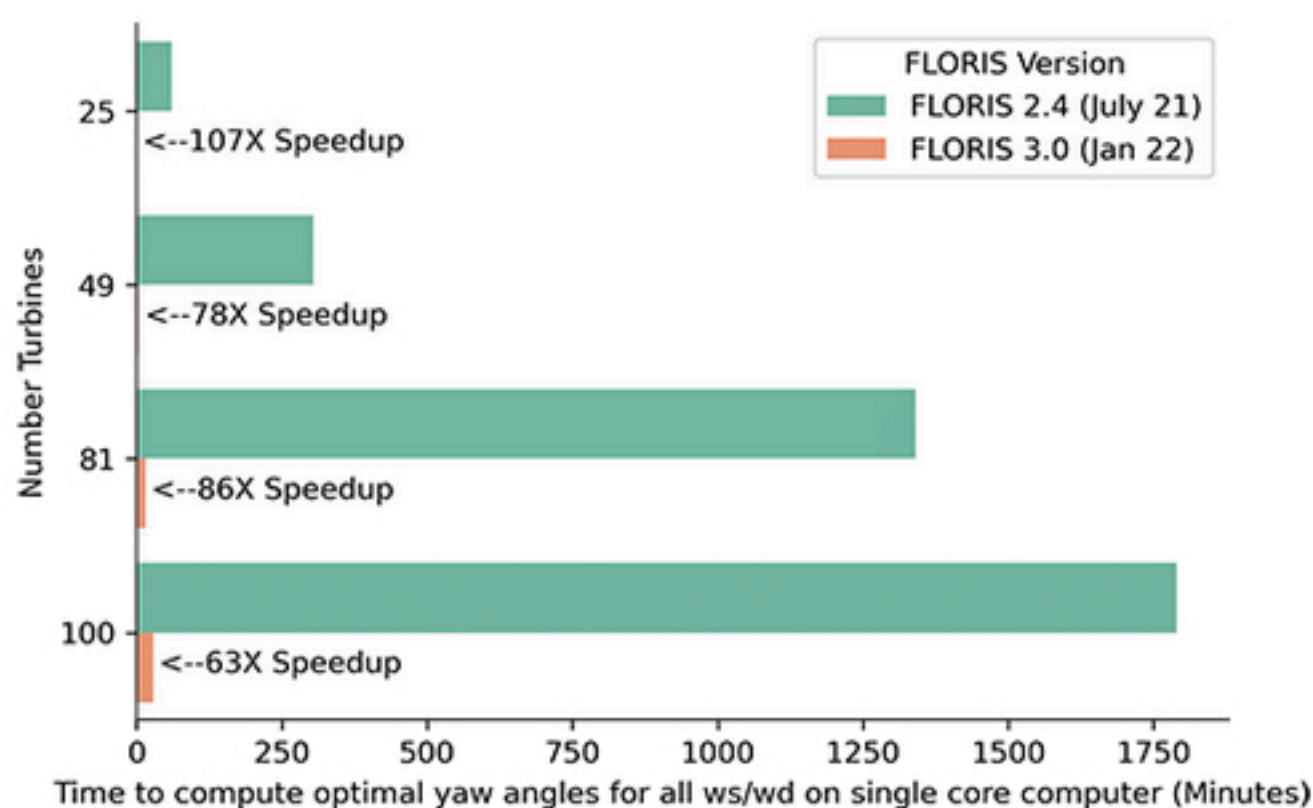
## Announcing FLORIS Version 3.0rc1

The Wind Energy Controls Research Team of the National Renewable Energy Laboratory is excited to announce the initial public beta release of FLORIS version 3.0. FLORIS v3.0rc1 represents a major redesign, rewrite, and enhancement of the FLORIS wind farm controls software. FLORIS v3.0rc1 includes:

- **Complete redesign of the software architecture.** The new architecture converts the software to a data pipeline model. With this framework, we reduce memory overhead while simplifying programming interfaces between modules. This enables rapid and easy implementation of new wake models, turbine models, and solvers. Additionally, the new code is vectorized (SIMD), replacing loops over wind speeds and directions with single vectorized calculations.
- **Improved computation speeds.** By leveraging vectorization, improved memory management, and new performance-focused optimization algorithms, FLORIS is substantially faster. For example, the time to compute a full wind rose AEP for a 25-turbine wind farm is more than 30x faster than the previous version (v2.4), and 100x faster than v2.1.



The performance impact on the yaw optimizations used in wake steering are even more pronounced. Leveraging both vectorization and improved algorithms enables optimizations that could only run to completion on computer clusters to now be run on a single laptop. For example, the time taken for determining the optimal yaw angles across the wind rose of directions for a 25-turbine farm drops from 61 minutes (v2.4) to 34 seconds (v3.0) on single core machines, 107 times faster.



- **Improving accuracy for large offshore wind farms.** A new model of the cumulative wake of wind turbines in wind farms was recently introduced in "[Analytical solution for the cumulative wake of wind turbines in wind farms.](#)" This model is now included in FLORIS and upcoming publications will demonstrate improved prediction for wake losses in large offshore wind farms when compared to SCADA data.
- **FLASC:** An initial release of the FLORIS-based Analysis for SCADA data ([FLASC](#)) is also available. FLASC is a companion open-source repository to FLORIS that implements the methods used in NREL's research for the postprocessing of field data, model analysis and comparing FLORIS to SCADA data.

### Pre-release and Full Release Schedule

The initial version of the new FLORIS is tagged v3.0rc1, and it is now open for beta testing. The full release of FLORIS v3.0 will be available on Monday, February 28. The current pre-release includes all core functionality as well as example scripts for:

- Computing a wind farm AEP
- Running an optimization to determine wake steering yaw setpoints
- Visualization of flow at hub-height, downstream cross-sections, and transverse slices.

The full release will further include:

- Vectorized, heterogenous wind speed inputs
- Support for multiple-turbine-types
- Improvements, bug fixes, and critical features identified during beta phase.

### Beta Testing

Because v3.0 includes some API changes to the interfaces of FLORIS, we welcome you to participate in an open beta testing period prior to the full release. We highly value feedback from the community. Thus, if you are interested in evaluating the pre-release of version v3.0rc1:

- Register to beta test here: <https://forms.office.com/g/AmpAkJVvja>
  - If you have a particular interest in programming wake models or having a wake model you developed integrated into FLORIS, please note that in the comment field.
- Download the code from the FLORIS GitHub repository using the v3.0rc1 tag
  - <https://github.com/NREL/floris/tree/v3.0rc1>
    - Follow the installation instructions on the README: <https://github.com/NREL/floris/blob/v3.0rc1/README.rst#installation>
- Use the provided examples of the new API to get started
  - <https://github.com/NREL/floris/tree/v3.0rc1/examples>
- Contribute to open discussions at GitHub Discussions
  - Post comments to this interactive forum between now and Wednesday, February 16
  - We will incorporate feedback into the v3.0 roadmap

We are extremely pleased and excited to be sharing FLORIS v3.0 with the greater public and look forward to working collaboratively toward the future of wind farm control!

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